SIMON NEWCOMB, F.R.S., LL.D., D.C.L.

(*Read April 23, 1910.*)

The subject of this sketch, Simon Newcomb, furnishes a conspicuous instance of a career carved out by the man himself. Born March 12, 1835, in what seems to us a remote region of Nova Scotia, with nothing in his early history to suggest much beyond a perpetual struggle for existence, he, nevertheless, by the exercise of great natural talent, with undaunted pluck and perseverence, succeeded in attaining a place in the front ranks of his favorite science, that science which some of us, at least, consider the noblest of all—namely astronomy.

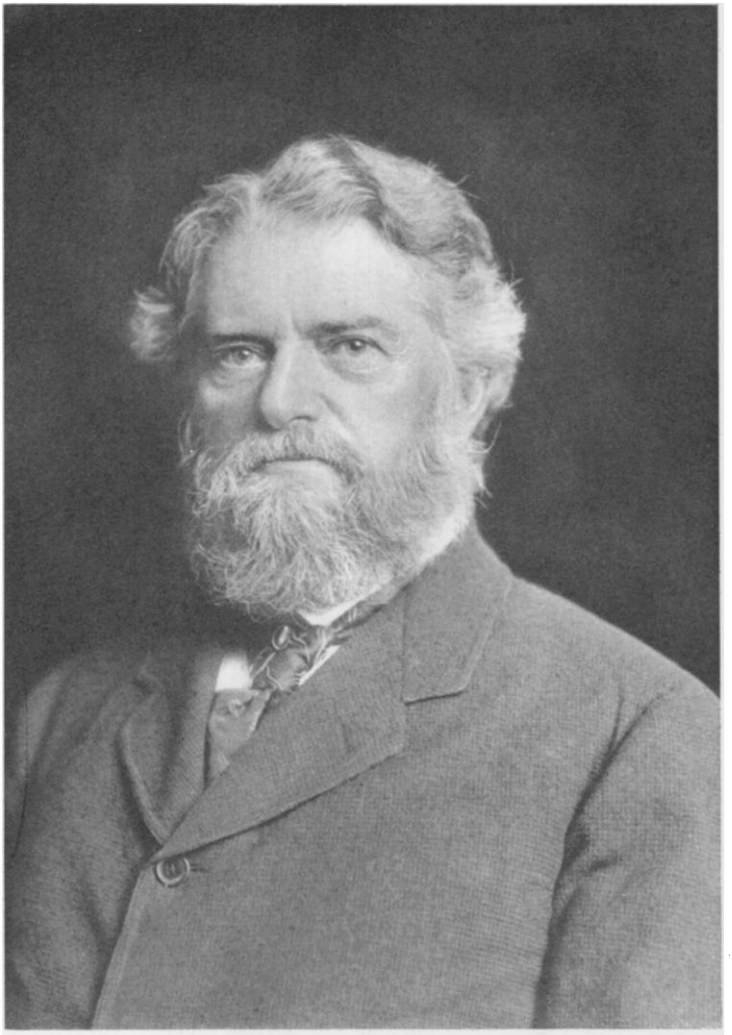
Though born in Nova Scotia, Professor Newcomb's ancestors were of that sturdy New England stock which his furnished so large a proportion of our distinguished men, and which has contributed so powerfully toward making our nation what it is to-day.

In his remniscences, Professor Newcomb says:

> So far as the economic conditions of society and the general mode of thinking were concerned, I might lay claim to have lived in the time of the American Revolution. A railway was something read or heard about with wonder, a steamer had never ploughed the waters of Wallice Bay. Nearly everything necessary for the daily life of the people had to be made on the spot and even at home.

It was in this environment of Arcadian simplicity that young Newcomb passed his early years. His father's occupation was that of school teacher—not a lucrative one, and made even less so by the fact that he had ideas of his own on the subject of education which were not in strict harmony with those of his contemporaries. Wealth and poverty are, however, relative terms, and this early period which, from our point of view, would no doubt appear to be one of considerable privation, was probably not so regarded by those immediately concerned.

Such were the surroundings in which the first sixteen years of young Newcomb's life were passed. Where everyone labored from daylight to dark, his lot could not be expected to form an exception.



Simon Newcomb

The future seemed to have only the vaguest prospects of any other lot. His father indeed spoke of an ambition to see him a prominent lawyer, while it was his mother's wish that he should become a clergyman, although she feared that he would never be good enough. In his own day dreams, he was a farmer, driving his own team, although he appears never to have found himself in harmony with this mode of life, being greatly mortified at his want of skill, particularly in the art of driving oxen.

At the age of sixteen, an opportunity presented itself which seemed to offer a solution of the problem of a career for the future, more in keeping with the tastes of a young man like Mr. Newcomb, than the life of a farmer. This was an arrangement with a quack doctor, Hershay by name, by which Newcomb was to live with the former until of age, assisting about the house and office in whatever way he could, in return for which the doctor was to teach him what he knew of medicine. It cannot be said that the doctor failed to carry out this part of the contract, but as a guide and example at this formative period of a young man's life, nothing could be more pernicious. On the only occasion when the doctor expressed himself freely to his pupil, he gave his views as to the true secret of success as follows, "The world is all a humbug and the biggest humbug is the best man." As for Newcomb, it seems very unfortunate that he should have wasted two years of his life with the petty drudgery of this position, when he was so obviously receiving nothing in return. The relation was, however, terminated by Newcomb, two years before the expiration of the contract by the simple and effectual process of running away. In due time, he joined his father at Salem, Massachusetts, who had decided to try his fortune in the states, his mother having died some years before. Before very long the young man found himself in charge of a country school, at a place called Massey's cross roads, and later at Sudlersville, Kent County, on the east shore of Maryland.

This may be considered as the beginning, though an humble one, of a new order of things, the outcome of which was to be the distinguished scientist as we know him, the recipient of the highest honors and distinctions which the world of science and culture had to bestow.

In Newcomb's accounts of the early years of his life we are impressed by the small amount of encouragement and assistance which he found in his vague aspirations toward something better. He seems to have read everything that came within his reach. This included a number of very uninviting works on geometry and algebra, navigation and the like, which very few boys would have the courage to attempt without a teacher. But the entire absence of anyone capable of directing him in his studies, is perhaps even more marked than the absence of books. Everyone in this primitive region where his early life was passed, seems to have been so absorbed in the struggle for existence that very little energy remained for anything else. If during the first eighteen years of his life, he ever met anyone who had seen a college, I have found no mention of the fact.

In 1856 Mr. Newcomb found himself teaching in the family of a planter named Byran, fifteen or twenty miles from Washington. He could, therefore, readily visit this place at frequent intervals. He tells us that, up to this time, he is not aware that he had ever seen a real live professor. He had, however, had a little correspondence with Professor Henry, which is so characteristic of the kindly and genial nature of the latter as to be worth relating. While teaching at Sudlersville, Mr. Newcomb made what appears to have been his first serious attempt at an original mathematical investigation, viz., "A New Demonstration of the Binomial Theorem." This he sent to Professor Henry, asking whether he considered it suitable for publication. Instead of consigning it to the waste paper basket and giving it no further attention, as many a man in Professor Henry's position would have done, he gave a negative reply, but as mathematics was not his specialty, offering to submit the document to some one better informed than himself in such matters. As was to have been expected, an adverse report came to hand in due time, which Professor Henry transmitted, accompanied by a pleasant note from himself to the effect that, although not so favorable as might have been expected, it was sufficiently so to encourage further effort. Soon after this Mr. Newcomb took what was for him the bold step of calling on Professor Henry, who not only received him with

characteristic kindness, but in due time introduced him to Professor Hilgard, of the Coast Survey, who in turn introduced him to Professor Winlock, of the "Nautical Almanac."

At this time the headquarters of this publication were at Cambridge, Mass. Encouraged by a note from Professor Henry, Mr. Newcomb started for Cambridge in December, 1856, hoping to find employment. After some delay, he was finally installed as computer at a salary of thirty dollars a month. Humble as this may appear to us, the day of receiving the appointment was probably the happiest of his life up to this time. Professor Newcomb speaks of his first arrival at this destination as follows:

> I date my birth into the world of sweetness and light on one frosty morning in January, 1857, when I took my seat between two well-known mathematicians, before a blazing fire in the office of the Nautical Almanac at Cambridge, Mass. The men beside me were Professor Joseph Winlock, the superintendent, and Mr. John D. Runkle, the senior assistant in the office.

Nearly five years were passed here amid surroundings which were very pleasant and agreeable, the more so by contrast with Mr. Newcomb's former life. They were years of education and development, the opportunities being peculiarly favorable. No fixed hours of attendance were required at the office. If the work assigned was due satisfactorily, that seems to have fulfilled every requirement. This made it possible for Mr. Newcomb to become a student in the Lawrence Scientific School, from which he graduated in due time. His course was naturally largely mathematical under the direction of the well-known Benjamin Peirce. The number of students at this time, following this line of work was naturally small, but Professor Peirce's abstruce lectures found at least one appreciative listener. We naturally feel considerable pride in the prominent place which American astronomy and astronomers occupy in the world today. Matters were, however, very different in this respect fifty-five years ago. It was about this time that the situation was summed up as follows by a German "Gelehrte" who had recently visited this country, "You have one astronomer, Professor Peirce, and no mathematicians." The prediction of Alexis de Tocqueville, that the conditions of life in America would never be favorable to the

development of eminence in science, seems to have been tacitly accepted by many as practically disposing of the matter.

The beginnings of physical science in America have been compared to the birth of Minerva as she sprang fully armed from the brain of Jove. The simultaneous appearance, here in Philadelphia, of Franklin, Rittenhouse and William Smith, at once brought this country to the notice of the devotees of science in Europe. The interest taken in the transit of Venus in 1769, for observing which elaborate preparations were made in Philadelphia, brought astronomy to the front, with plans for a first class astronomical observatory with, presumably, Rittenhouse as director. This project was probably premature, but in any case the approaching revolution soon absorbed all the energies of the country, and three quarters of a century was destined to elapse before anything like a general revival of interest in this subject took place. At the time of which we are speaking, however, the movement was well under way, and the men with whom Mr. Newcomb was associated at Cambridge including more than one name destined to achieve international reputation. A number of observatories were in more or less active operation but, as yet, little had been produced which could bear comparison with the best work in Europe.

The work, however, was well begun, but was no doubt destined to be somewhat retarded by the Civil War—the preliminary skirmishes were even now being fought in Kansas and elsewhere. But the times were ripe for an advance and it could not again be suppressed.

On July 17, 1860, occurred a total eclipse of the sun. The path of totality passed across British North America, touching southern Greenland, thence across the Atlantic to Spain. Mr. Newcomb was one of a party organized for observing the eclipse. The point chosen was on the Saskatchewan River, about as inaccessible and remote from civilization at that time as central Africa is today. The journey lay from St. Paul across Minnesota by stage, thence down the Red River by steamer, across Lake Winnipeg and up the Saskatchewan by birch bark canoe. Unexpected delays and difficulties seemed likely to prevent the party from reaching its destination in time for the eclipse. By heroic exertion on the part of the half

breeds who paddled the canoe, however, they arrived at the place selected on the evening before the eclipse was to take place. Clouds, however, covered the sky so that nothing could be done, a not uncommon experience in such cases.

In 1861 Mr. Newcomb was informed of a vacancy in the corps of professors of mathematics attached to the Naval Observatory at Washington, with the suggestion that he should apply for the place. Although the desirability of some position of greater prominence and with a better outlook for the future was not new, still the surroundings and attractions at Cambridge were so congenial that the thought of severing them was not an agreeable one. After some hesitation, however, Mr. Newcomb made formal application for the professorship and, as he confesses, was greatly surprised to receive, a month later, his commission, duly signed by Abraham Lincoln.

The duties at the Washington Observatory were of a character entirely new to Mr. Newcomb. The use of instruments in practical work was entirely outside his experience. In fact, with the exception of two or three visits to the Cambridge Observatory, he had never been inside such an establishment. Nor had he any particular liking for this kind of work, which, it must be confessed, involves a great amount of drudgery, and interferes sadly with continuous theoretical investigation.

The Washington Observatory was at that time practically the only place in the country where continuous observation was carried on. The principal instruments consisted of a mural circle in charge of Professor Yarnall, with the necessary clocks and subsidiary apparatus. In point of accuracy and precision, these were not what we should call first class instruments. But the methods followed were even worse than the instruments. Each observer pursued his own plan, observing what he pleased and when he pleased, with no uniformity of program, employing no uniform system of reduction, so that anything like homogeneity of results was out of the question. To add to the difficulty, the observatory was situated in a malarial district near the Potomac, far from the resident quarter of the city, so that the observers were compelled to walk from one to three miles through muddy streets in going and returning from work.

Mr. Newcomb was at first assigned to duty as assistant to Professor Yarnall on the transit instrument. The results of this system or want of system, were afterwards published, forming the Washington catalogue of 10,964 stars, commonly known as "Yarnall's catalogue." Though by no means worthless, this is far from possessing the value which it should have had. The work done at Greenwich, for instance, at the same time, was much superior.

It is to be remembered that, at the period of which we are now speaking, the Civil War was raging at its greatest fury. Washington was the center of gigantic military operations which seemed to overshadow everything else. But those in authority took a certain pride in having this work kept up without interruption during the conflict. On one occasion only does the serenity, supposed to attend scientific pursuits, seem to have been seriously disturbed. This was on the occasion of the noted raid of General Early in 1864. The defeat by the latter of General Lew Wallace seemed to leave the way open to Washington. It is an open question whether the city might have been taken by a rapid dash on Early's part at this time. Under these conditions, all who were in the service of the war and navy departments were ordered out to assist in manning the entrenchments which were the only defence of the city. The detachment to which Professor Newcomb was assigned was ordered to Fort Lincoln, where for two days they waited an attack by Early. Meanwhile reinforcements arrived from Fort Monroe and Early abandoned any design which he may have had for an attack.

Captain Giliss, the superintendent of the observatory, was an astronomer of distinction. Previous to his taking charge of this work, he had made many thousands of observations. He was naturally much interested in the improvement of the unsatisfactory state of affairs, but it was not an easy matter, in these exciting times, to accomplish much. At length, in 1863, he obtained authority to procure a meridian circle of the highest order of excellence, which was finally completed and ready for active service on January 1, 1866. Professor Newcomb was placed in charge with three assistants. An elaborate program of fundamental work was adapted to be carried out on a uniform plan for three years. This involved continuous attendance on the part of one or another of the observers,

both day and night whenever the weather permitted observation. Much was expected in the way of results, superior perhaps to anything before attained, but these anticipations were not fully realized. The instrument itself was not what had been expected and the mounting proved unstable, so that the results, instead of the superiority which had been looked for, proved inferior to those reached at the European observatories.

When a large telescope was installed at Washington toward the end of 1875, Professor Newcomb was placed in charge of the instrument, which at his request was turned over to Professor Hall two years later. This closed Professor Newcomb's activities in the way of systematic observation.

In 1869 he made application to be transferred to the office of the "Nautical Almanac," with the understanding that his time should be devoted to an investigation of the moon's motion, a problem in which he had become greatly interested. Doubtless there is room for honest difference of opinion as to the relative importance of the two branches of astronomical work, but if the lunar problem was to have been taken hold of at this time, there is no question as to whom it should have been entrusted. Men could be found in plenty who were capable of reaching valuable results in the field of observation, but those who were capable of attacking with success the most intricate of all astronomical problems, the lunar theory, have always been extremely few. The transfer to the "Nautical Almanac" was not made, but the arrangement which resulted was probably even more satisfactory. A few years before Newcomb began his work on the moon, the lunar tables of Hansen had been published. They were based on a part only of the Greenwich observations from 1750 to 1850, and represented with practical accuracy the moon's motions for this period of a full century. But, in the course of a very few years, the actual position was found to deviate very appreciably from those given by the tables, the deviations increasing from year to year. What the state of things previous to 1750 had been was a very interesting question, but one not easy of solution, as very little material accurate enough for such an investigation was known to exist.

The ordinary meridian determinations, before the time of Bradley, 1750, were of very little use for a refined investigation like this. Another class of observations, however, furnished data comparable in accuracy with the best determinations made today, that is, the occultations of stars and planets by the moon. Though but few such had ever been published, it occurred to Professor Newcomb that among the unpublished work at the European observatories, possibly enough such data might be found to repay the labor involved in the search. The result exceeded his most sanguine expectations. At the Paris observatory, in particular, data were brought to light which carried the period of accurate lunar observation back nearly a century, so that now instead of a lunar theory, which like that of Hansen depended on one hundred years of observation, we have available two hundred and fifty years of accurate data.

It is interesting to know that this work at the Paris Observatory was carried on while the struggle with the Commune was at its height, the windows frequently rattling with the reports of cannon.

The lunar theory, as it is called, seems to have been the problem of Professor Newcomb's predilection. Besides the researches already mentioned which involved a great amount of time and labor he wrote, together with other papers, an elaborate memoir dealing with the action of the planets on the moon. He did not attempt, however, a complete revision of the subject. His most important services in this direction were in what has been styled the border land between the theoretical and practical, viz., that of assembling all available data and comparison with theory, thus exhibiting in a concise manner precisely what remains to be accomplished in order to bring the two into harmony.

The last of his published papers is found in the *Monthly Notices of the Royal Astronomical Society* for January, 1909, exhibiting the deviations of the mean longitude of the moon from the position given by theory. The explanation of these discrepancies now constitutes one of the most interesting of the unsolved problems of astronomy.

The theoretical researches in the lunar theory have been greatly extended by the classic work of Mr. George W. Hill, while the

prodigious labor involved in applying the latter to the derivations of new tables of the moon's motion is being well taken care of by our fellow member, Professor Ernest W. Brown.

In September, 1877, occurred an event which had been long anticipated, viz., the retirement of Professor Coffin from the directorship of the "Nautical Almanac," and the appointment of Professor Newcomb to this position. Meanwhile, in 1875, the directorship of the Harvard College Observatory became vacant by the death of Professor Winlock. Soon after, Professor Newcomb was surprised to receive from President Eliot a letter offering him the position. Although, as has been said already, the practical work of an observatory was not the line of activity which appealed most strongly to Professor Newcomb's tastes, a professorship at Harvard, with all that this implies, was not to be lightly disregarded. There was, moreover, opportunity for escape from the political atmosphere with all its petty annoyances, attendant on a government position at Washington.

I do not know that Professor Newcomb was ever fully convinced that he had chosen the better course in declining this offer, though he disposes of the matter very modestly as follows: "No one who knows what the Cambridge observatory has become under Professor Pickering can feel that Harvard had any cause to regret my decision."

The directorship of the "Nautical Almanac" now gave Professor Newcomb the long-wished-for opportunity to take up seriously the herculean task of a complete revision of the entire subject of exact astronomy. Only those who have had some experience in these matters can form any adequate conception of what this involved. The vast field of stellar astronomy, of the planetary and lunar motions, had been cultivated since the time of Hipparchus by many of the ablest minds which the world has produced. As, however, each investigator usually carried on his work independently of the others, there was great want of consistency and homogeneity in the mass taken as a whole. Professor Newcomb may not at first have planned so large an undertaking, but this is the form which it assumed. For twenty years, during which he remained at the

head of the "Nautical Almanac," assisted by a small army of aids and computers, including at least one man of international reputation, and at one time or another a dozen line officers of the navy, this work went steadily forward.

All who are in any way interested in the professional work of astronomy are familiar with some part at least of the eight quarto volumes of astronomical papers of the "American Ephemeris" which contain the most important results of this undertaking. This is not the place for an analysis of the contents of these volumes or for more than the briefest outline of the work attempted. It may be said that it involved a complete investigation of the orbits of the principal planets, on a uniform plan employing a strictly homogeneous system of constants derived from practically all existing data. For the latter purpose, the number of observed positions of the sun, Mercury, Venus and Mars alone numbered 62,030, made at thirteen different observatories. The investigations for these inner planets, and the two outer ones, Uranus and Neptune, were made by Professor Newcomb himself or under his personal direction. That of Jupiter and Saturn was entrusted entirely to Mr. George W. Hill. A man more competent could not have been found on either side of the Atlantic. Without his valuable assistance, it would hardly have been possible to bring the task to a successful close. Redeterminations of the solar parallax, the constants of precession, nutation and abberration were involved directly or indirectly in the undertaking, together with an elaborate investigation of the places of the fixed stars, on which, in the last analysis, all else depends.

This work, which has been outlined, was near completion when the time for retirement under the age limit arrived. Doubtless, Professor Newcomb would have preferred to remain at his post some time longer, but the law was inexorable.

His retirement did not, however, imply cessation from activity. Arrangements were made by which this great work was brought to a practical completion. The lunar researches were provided for by a grant from the Carnegie fund, and were completed only a short time before his death, under conditions of physical suffering, such that very few would have had energy for any purpose.

Besides the activities which have been briefly outlined in what precedes, Professor Newcomb was more or less directly connected with a large number of scientific undertakings, particularly with many astronomical enterprises of importance in which this country was concerned. He was secretary of the Transit of Venus Commission in 1874 and 1882, and was in charge of a party in 1882 for observing the transit at the Cape of Good Hope. This event attracted much attention at the time and there seems to have been no difficulty in obtaining from Congress appropriations aggregating $375,000 for the purpose. Yet a small sum of perhaps $5,000 for preparing the results for publication has never been forthcoming. The work has consequently never been published and there is little prospect that it ever will be.

Professor Newcomb also took part in several eclipse expeditions, one of which, that of 1860, has already been mentioned. He was, to a great extent, responsible for the planning and installing of the large telescope at the Washington Observatory, at that time the largest refracting telescope in the world. The details of location, construction and equipment of the Lick Observatory were settled, for the most part, by his advice in coöperation with Professor Holden, its first director.

Professor Newcomb was appointed professor of mathematics and astronomy at the Johns Hopkins University in 1884, as successor to Professor Sylvester. His duties as teacher closed in 1894. In 1900 he was made professor emeritus. He was editor of the *American Journal of Mathematics* from 1884 to 1894, and during 1899 to 1900.

Professor Newcomb was president of the American Association for the Advancement of Science in 1876 and 1877, of the Astronomical and Astrophysical Society of America from its beginning in 1899 until 1905, of the American Mathematical Society, the Society for Psychic Research, and chairman of a great number of scientific assemblages and congresses, the most important of which was perhaps the International Congress of Arts and Sciences, held at St. Louis in 1906 in connection with the exposition, the complete success of which was due more than anything else to his world-wide repu-

tation and to the untiring energy with which he planned and carried out the undertaking.

Professor Newcomb was a recipient of honorary degrees from seventeen American and foreign universities; academies and scientific organizations throughout the world honored him with membership, decorations and medals, until the supply was almost exhausted. Among others, he was one of the eight foreign associates of the Institute of France, a distinction which had come to no other American scientist since the time of Franklin. He was commander of the Legion of Honor of France. From the German Emperor he received the highest honor which he could bestow, viz., Knighthood for Merit in Science and Art, a distinction held by no other native American. The complete list is too long for this time and place.

He was presented to Emperor William, to King Edward, the kings of Italy and of Sweden, and the president of the French Republic.

A complete bibliography of Professor Newcomb's writings embraces about four hundred titles. A large variety of subjects, practically every phase of astronomical science, received some attention. Many of these works are elaborate treatises embodying the labor of years. There are papers on pure mathematics, on political economy, in which he was greatly interested, series of astronomical and mathematical text-books, and many books and magazine articles of a popular or semi-popular nature. The following are a few specimen titles: "Reminiscences of an Astronomer," "Sidelights on Astronomy," The A. B. C. of Finance," "Principals of Political Economy," "A Plain Man's Talk on the Labor Question," "Popular Astronomy," "Astronomy for Everybody." Translations of his books are to be found in the German, Russian, Dutch, Norwegian, Bohemian and Japanese languages.

Professor Newcomb's ability to concentrate his attention strictly on the matter in hand was a very important factor in accomplishing what he did. This perhaps gave an impression of indifference and unsociability in the minds of those who knew him only casually. Naturally he had little patience with the too numerous class of charlatans and cranks who are always ready to waste the time of a

man of any prominence in expounding their peculiar views, but those who sought his advice and encouragement in reference to a matter of any importance found him more than ready to give such assistance as lay in his power.

His busy life naturally limited his social activities. He cared little for fashionable gatherings, but he greatly enjoyed the company of congenial minds, and many men of science, residents of Washington, and visitors from other places, can testify to the hospitality with which they were entertained at his home. He was very fond of history and poetry, his favorite poems seem to have been memorized with very little effort. Addison's Ode, "The Spacious Firmament on High," especially the closing lines, appears to have given him great pleasure:

"What though in solemn silence all
Move round the dark terrestrial ball?
What though no real voice nor sound
Amid their radiant orbs be found?
In reason's ear they all rejoice
And utter forth a glorious voice
Forever singing as they shine,
The hand that made us is divine!"

Professor Newcomb was always religiously inclined, though he never became a church communicant. For many years he attended the Presbyterian Church with his wife and family. And he was a firm believer in a future life. One of the great pleasures to which he looked forward was that of meeting such men as Hipparchus, Copernicus, Newton and others who had gone before.

Professor Newcomb was the oldest of seven children. Two brothers and two sisters survived him.

In 1863, he married Miss Mary Caroline Hassler, daughter of Dr. Hassler, of the U. S. Navy, who lost his life in the wreck of the steamer *Atlantic*. Her grandfather was Ferdinand Rudolph Hassler, founder and first superintendent of the U. S. Coast Survey.

A widow, three daughters and eleven grandchildren survive him. An only son died in infancy. After a protracted and very painful

illness, Professor Newcomb passed away July 13, 1909, leaving as a heritage to his family and his country, the memory of

> One of those few immortal names
> That were not born to die.

I now have the pleasure of inviting your attention to this portrait, by C. H. L. Macdonald, in which you will recognize the features of our late vice-president. Its presence here is due to the liberality of a number of our fellow members who believe that in thus honoring the memory of Professor Newcomb they are at the same time honoring themselves.

Mr. chairman, in behalf of the committee having this matter in charge, I beg to present this portrait to the Philosophical Society, not doubting that it will be considered worthy of a place beside those of Franklin and Rittenhouse and of these other distinguished men who, in various activities, have contributed so greatly to the glory of this society and of the nation.

C. L. DOOLITTLE.

VICE-PRESIDENT PICKERING, in receiving the portrait, spoke substantially as follows:

It is difficult to add to the statement just made, and to those of others, any new facts regarding the life of Simon Newcomb. I could only tell you of personal recollections which would not be in place here. Our friendship, extending over forty years, was enlivened by many differences of opinion, but never marred by hard words or unkind feelings. It was never safe for anyone to make an absolute statement to Newcomb unless they were prepared to defend it by established facts.

A striking characteristic of the work of Newcomb was its versatility. Both astronomers and mathematicians regarded him as a leader, while his contributions to philosophy, to political economy and to other sciences were numerous and valuable. It was curious to see how, after devoting a life to the older astronomy, he became deeply interested in astrophysics, at an age when many men cease to do useful work.

The excellent portrait before you is especially welcome, since it is the gift of many, not of a few, of his admirers. As it hangs on the walls of this room it should serve as a model to us all. What happier lot can be asked for a man who, after retirement for age from the service of the United States, could continue his work with the greatest vigor, could live to see the greater part of it completed, and who retained his intellectual powers to the end?

In the name of the American Philosophical Society, I accept this gift to it, and tender the thanks of the members to the donors.